1) Title Page of Research Proposal:

a) Title of the Research:

Impact and Constraints of Agricultural Technology Management Agency (ATMA) as Perceived by Stakeholders of Sikkim.

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Impact and Constraints of Agricultural Technology Management Agency (ATMA) as Perceived by Stakeholders of Sikkim.

Introduction

Since man started cultivation of crops, extension evolved. As agriculture became complex the extension approaches also co-evolved to suit the specific needs of the farmers. Post green revolution era called for a paradigm shift in the extension approach. Extension grew out from the delivery of production messages to improvement in the income of the farmers, with a focus on market-driven, farmer-led extension called as Agricultural Technology Management Agency (ATMA) (Planning Commission, 2007; Singh and Swanson, 2006; Singh*et.al.*, 2006; Swanson, 2006; World Bank, 2006).

Concept of "ATMA MODEL"

The Agricultural Technology Management Agency (ATMA) is an autonomous organization registered under the "Societies Registration Act of 1860" that has considerable operational flexibility e.g. it can receive and dispense government funds, enter into contracts, maintain revolving funds, collect fees and charge for services. In addition, it operates under the direction and guidance of a Governing Board (GB) that determines program priorities and assesses program impacts. ATMA is headed by the Project Director or PD under the National Agricultural Technology Project (NATP), and reports directly to the GB as Member Secretary. The PD helps coordinate and integrate all agricultural research and extension activities carried out within the district (Singh *et. al.* 2005a and Singh, 2006).

The National Agricultural Technology Project (NATP) was initiated in India with World Bank support in the year 1998 and phase wise ATMAs were established in pilot project districts. ATMA was considered as a dynamic instrument for introducing major changes in the Agricultural Research and Extension systems of the country, besides developing their capabilities to meet future challenges.

Extension Reforms in India were pilot tested in 28 Districts in 7 States from 1998 to 2005. This successful experiment served as a basis to launch the Scheme "Support to State Extension Programmes for Extension Reforms" in the year 2005-06. It was revamped, expanded and strengthened comprehensively in the year 2010. Coverage of the scheme was increased in a phased manner. It is currently operational in 639 districts and the remaining rural districts are also proposed to be covered.

Aims and Objectives of ATMA

The Scheme 'Support to State Extension Programmes for Extension Reforms' aims at making extension system farmer driven and farmer accountable by disseminating technology to farmers through new institutional arrangements viz. Agricultural Technology Management Agency

(ATMA) at district level to operationalise the extension reforms on a participatory mode. This Scheme shall focus on the following key extension reforms:

• Encouraging multi-agency extension strategies involving Public/Private Extension Service Providers.

• Ensuring an integrated, broad-based extension delivery mechanism consistent with farming system approach with a focus on bottom up planning process.

• Adopting group approach to extension in line with the identified needs and requirements of the farmers in the form of Commodity Interest Groups, Farmer Interest Groups and Food Security Groups consolidate them as Farmers Producer Organizations.

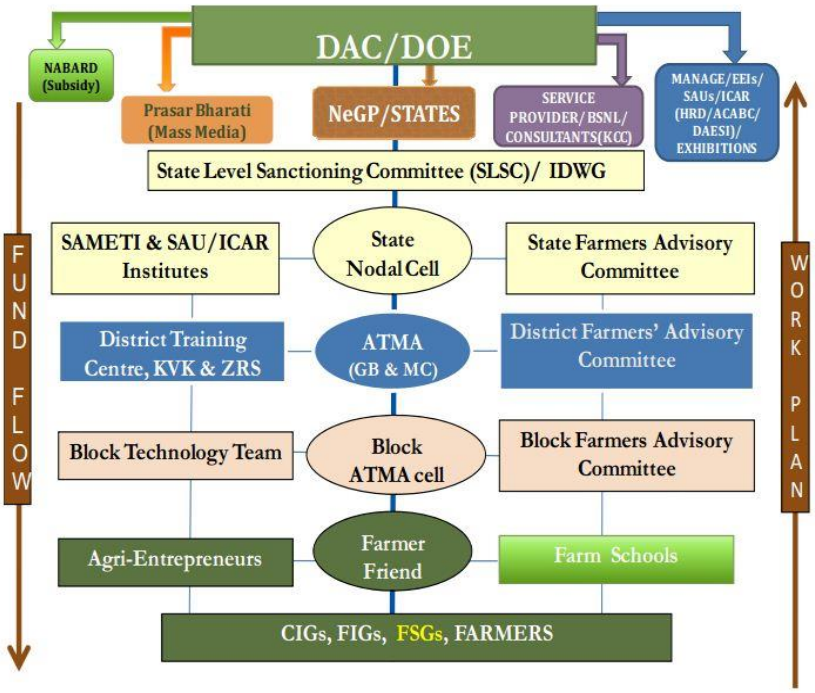
• Facilitating convergence of farmer centric programmes in planning, execution and implementation.

• Addressing gender concerns by mobilizing farm women into groups and providing training to them.

Salient Features of ATMA

- Creating Farmer Advisory Committee to improve feedback.
- Using NGOs to organize farmers.
- Encouraging private sector involvement in technology transfer.
- Validation and refining technologies through research units in the district.
- Bottom up planning procedure.
- Increased use of Information Technology.
- In-service training to increase staff competence.
- Developing new Public-Private partnerships.
- Formation and strengthening of FIGs, CIGs and FSGs.

Organizational Structure of ATMA



Source: Guidelines for the Centrally Sponsored Scheme "National Mission on Agricultural Extension and Technology (NMAET)" to be implemented during the XII Plan, 2014.

Presently ATMA is being implemented nationwide and the remaining rural districts are also proposed to be covered. And Sikkim the 22nd state of India, had also implemented this ATMA model covering its four districts i.e. East District, West District, North District and South District. The state of Sikkim is characterized by mountainous terrain and almost the entire state is hilly, with an elevation ranging from 280 meters (920ft) to 8,586 meters (28,169ft). For the most part, the land is unfit for agriculture because of the rocky, precipitous slopes. However, some hill slopes have been converted into terrace farms.

Agriculture is vital to the progress of Sikkim, because more than 64 percent of population depend on agriculture for their livelihood. Sikkim's economy is based predominantly on agriculture, with the sector engaging more than half of the working population and it has been the backbone of our economy, representing about a third of State's Gross Domestic Product.

In Sikkim, ATMA model now is being going successful in addressing many of the extension problems, thereby promoting different schemes and programmes etc. Funds allocation and expenditure was released for extension reforms (ATMA) on 2007-2008 in East district and North district of Sikkim. And in the rest another two district i.e. West district and South district the fund allocation and expenditure was released on 2010-2011 in Sikkim.

For the overall success and achievements of ATMA within the state, the effective implementation, planning, monitoring as well as evaluation of any programmes and schemes is vital. Usually, the ATMA at district level would be increasingly responsible for all the technology dissemination activities at the district level. It would have linkages with all the line departments, research organizations, non-governmental organizations (NGOs) and agencies

associated with agricultural development in the district. Research and extension units within the project districts such as Zonal Research Stations (ZRS) or substations, Krishi Vigyan Kendra (KVK) and the key line departments of agriculture, animal husbandry, horticulture and fisheries etc. Extension Reforms in India were pilot tested in 28 Districts in 7 States from 1998 to 2005. This successful experiment served as a basis to launch the Scheme "Support to State Extension Programmes for Extension Reforms" in the year 2005-06. It was revamped, expanded and strengthened comprehensively in the year 2010. Coverage of the scheme was increased in a phased manner. It is currently operational in 639 districts including all four districts of Sikkim and the remaining rural districts are also proposed to be covered. ATMA model now is being going successful in addressing many of the extension problems, thereby promoting different schemes and programmes giving emphasis to intensive and judicious use of limited land so that the per capita land productivity and overall production is maintained at a desired level in Sikkim. Research system established by ICAR, SAUs and private companies is very good. In present agricultural scenario; evolving and making available of new technologies for farmers on location specific and need based are generally not the major problems. The main problem encountered today is that of adoption of new farm technologies as well as delivery of appropriate technology and improved agronomic practices to the farmers. Since Sikkim has been declared as organic state and the subsidy on chemical fertilizer is tapered and fully stopped by the year 2006-07. In order to replace the need of nutrient to crop, the Department is propagating and advocating farmers to adopt new and modern technology of organic farming system to sustain the crop production through enrich rural composting, vermicomposting, biofertiliser and other source of organic plant nutrients. The integrated nutrients management is the only alternative in organic farming system to improve the productions in sustainable manner. In this way, proper training and demonstration of farmers on nutrients management using various organic sources as well as maintaining of soil health can enhance their production level and also can change their level of skill, adoption and knowledge towards modern technologies, better agricultural and horticultural practices amongst the farming community.

Quite simply, though we hope not simplistically, we begin from the fact that all the activities of the scheme which has been implied or disseminated via ATMA is towards changing the mindset of people with; coordinated or integrated community approach, operational changes with flexible in decision-making system, use of Information Technology (IT) tools and media, strengthening of institutional linkages specifically for research and extension, effective coordination between all stakeholders, focusing on gender issues, bringing in eco-friendly outputs and helping to address poverty in the rural areas. Nevertheless the final outcome of the ATMA can be observed through the improvement of quality of life and empowerment of farming community including women leading to the sustainability of the approach or system and equity.

Keeping in mind the scenario of Sikkim with respect to the importance of ATMA towards ensuring the technology dissemination, ATMA have a profound importance for sustainable development and poverty alleviation of the farmers in Sikkim state, the present study entitled **"IMPACT AND CONSTRAINTS OF AGRICULTURAL TECHNOLOGY MANAGEMENT AGENCY (ATMA) AS PERCIEVED BY STAKEHOLDERS OF SIKKIM"** is aimed at extracting the maximum potential of available resources, with the following objectives:

1. To study the socio- economic and socio- personal orientation of the respondents.
2. To study the nature of work undertaken by ATMA in the study areas.
3. To study the level of awareness and understanding among respondents about ATMA work.
4. To ascertain the changes in knowledge, skill and adoption of the agricultural technologies among the farmers as a result of intervention of ATMA.
5. To ascertain the impact of ATMA in participants income and changes in knowledge, skill and adoption of agricultural technologies among the farmers.
6. To ascertain the perception of constraints regarding ATMA among the respondents and institutional members.
7. To ascertain the association between different socio-economic or socio personal variables with different consequences of ATMA.
8. To suggest some policies options.

Importance of the study

The objective stated above would indicate the practical utility of the research and the findings of this study also would help to understand the impact of Agricultural Technology Management Agency (ATMA) on socio-economic upliftment of farmers in Sikkim. The findings of the study can also provide feedback on the effectiveness of ATMA as the new extension system in India, in general as well as in Sikkim states in which the study is conducted, in particular. It can also provide useful guidance for understanding of various programmes implemented under ATMA. The findings of the study would also be helpful to understand the problems faced by the farmers in participation of different ATMA activities and to obtain the suggestions to overcome the problems faced by them.

Review Literature

In order to develop theoretical orientation some of the available as well as past research studies and literature related to the present study has been presented under the following heads:

M**atwa*et.al*.(2014)** conducted studies on Consequences of ATMA Project and Related Constraints and Suggestions in Anand district of Gujarat and foundthat more than half (61.67 per cent) of the maize growers had medium level of knowledge of maize cultivation technology followed by 20.00 per cent had high level of knowledge and 18.33 per cent maize growers had low level of knowledge of maize cultivation technology.

Lenin *et.al.*(2009) found out in their study on Decision Making by the Farmers in Agricultural Technology Management Agency that a majority (32 %) of the ATMA staff expressed that the farmers had very low level of decision making at various levels of implementation of ATMA.

Singh*et.al*.(2009) analyses the impact of ATMA in pilot district of Bihar and findings showed that overall performance of the project has been quite successful and effective in creating several institutions for strengthening the process of both development and dissemination of new or improved technologies. The project has been quite effective in facilitating the identification of real constraints faced by the farmers and adoption of new technologies or farm practices, new enterprises, etc. promoted by the project.

Singh*et.al*.(2014) conducted a study on Effectiveness of Training Programmes under Agricultural Technology Management Agency in Bihar and report that the trainings conducted under SREP-ATMA implementation were successful to some extent only and were rated as average. Capacity building is a core area in extension education and it needs attention during implementation of ATMA programme.

Research Setting

Locale of the study

The present study is planned to be conducted in the state of Sikkim which is one of the north-eastern Indian state that lies between 27^{o} 04’ 46” S to 28^{o} 07’ 48” N latitudes and88^{o} 00’ 58” W and 88^{o}55’ 25” E longitudes. The total geographical area of the state is only 7096 km^{2} and it is strategically located and shares international borders with the countries of Bhutan, China and Nepal, and in the south, it is bordered by the state of West Bengal in India.It has four districts – 1). East Sikkim, 2). West Sikkim, 3). North Sikkim and 4). South Sikkim and the district capitals are Gangtok, Gyalshing, Mangan and Namchi respectively. These four districts are further divided into subdivisions i.e. i) Gangtok, Pakyong and Rongli are the subdivisions of the East district;ii) Gyalshing and Soreng are the subdivision of the West district; iii) Mangan, Chungthang, Dzongu and Kabi are the subdivision of the North district and;iv) Namchi and Ravongla are the subdivision of the South district.

Hence, the present investigation will be undertaken in four subdivision one from each district and eight block (two block from selected subdivision) namely, Mangan and Dzongu from North District, Assam Lingzey and Sang Martamfrom East District, Namthang and Sumbuk from South District and Dentam and Martam from West District will be purposively selected for the study and also has been considered as the main study area. Total number of sixteen village covered

under ATMA will be randomly selected (two village from each selected block) and from each village 15 farmers participated in ATMA programme comprising 30 farmers from two blockand total number of 60 farmers from each district will be randomly selected. Thus total 240 farmerswill be selected and interviewed with the help of structured schedule developed for the study.

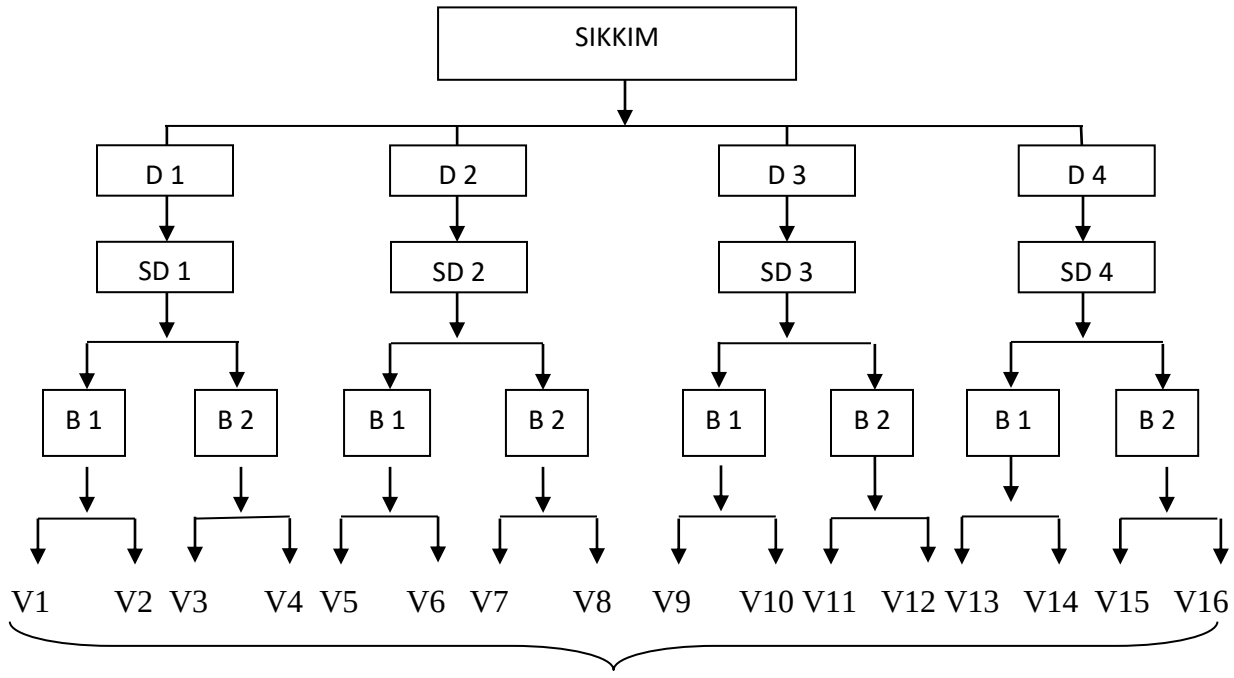
Research Methodology

The brief descriptions of research methodology which will be followed for envisaging the present investigation are represented below with the following heads and sub-heads;

1. Sampling Procedure
2. Data collection tool
3. Selection and measurement of variables
4. Statistical analysis of data

Sampling Design

Based on secondary information all four Districts of Sikkim will be selected on the basis of area coverage under the initiative. Purposive as well as simple random sampling techniques will be adopted for the study. The selection of the district and block will be selected based on some logic. And in case of selection of respondent's, simple random technique will be taken up covering to a total sample of 240 respondents from the selected sixteen villages. Further the respondents will be categorized based on logical criteria.



D= District

SD= Sub-Division

B= Block

VL= VILLAGE

Data Collection

Data will be collected from selected areas with the help of structured schedule developed for the study keeping in mind about the consequences indicators of the programme. Some indicators for measuring social, economic and cultural consequences will be identified through review of literature and pilot study.

Data Collection Methods

Personal interview method will be resorted for data collection from the respondents. Secondary information will be consulted for drawing support for interpretation of the findings.

Variables

The variables which are to be included are as under-

Independent Variables

Age, Education, Social Participation, Occupation, Size and Land holding, Economic Motivation, Scientific Orientation, Market Intelligence, Innovativeness, Mass Media Exposure and Extension Participation.

Dependent Variables

Change in Knowledge, Change in Skill, Change in Adoption, Change in Socio-economic condition etc.

1. Selected Variables And Their Measurements

The following selected variables and their measurement scale has been set up for the present study;

Table-1

Sl. no	Variable	Scales used for measurement
1.	Age	Trivedi 1963
2.	Education	Trivedi 1963
3.	Social Participation	Trivedi 1963
4.	Occupation	Structured interview schedule will be prepared for the study
5.	Size and land holding	Trivedi 1963
6.	Economic Motivation	Moulik 1965
7.	Scientific Orientation	Structured interview schedule will be prepared for the study
8.	Information Seeking Behavior	Structured interview schedule will be prepared for the study
9.	Innovativeness	Structured interview schedule will be prepared for the study

10.	Mass Media Exposure	Parrek and Trivedi 1964
11.	Extension Participation	Structured interview schedule will be prepared for the study
12.	Change in Knowledge	Structured interview schedule will be prepared for the study
13.	Change in Skill	Structured interview schedule will be prepared for the study
14.	Change in Adoption	E.M. Roger 2003
15.	Change in Socio-economic condition	Structured interview schedule will be prepared for the study

Statistical Tools

The statistical measures which will be employed for interpretation of data are mentioned as under:

i)Percentage, ii) Mean Score, iii) Standard Deviation, iv) Coefficient of Variation, v) Rank Order, vi) Score Gap, vii) Coefficient of Correlation, viii) Index Score Value and ix) Regression etc.

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